

United States Patent [19]

Fergason

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[54] ENCAPSULATED LIQUID CRYSTAL MATERIAL, APPARATUS AND METHOD

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[*] Notice: The portion of the term of this patent subsequent to Mar. 6, 2001 has been disclaimed.

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 302,780, Sep. 16, 1981, Pat. No. 4,435,047, and a continuation-in-part of Ser. No. 477,138, Mar. 21, 1983, Pat. No. 4,606,611, and a continuation-in-part of Ser. No. 477,242, Mar. 21, 1983, Pat. No. 4,616,903.

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C09K 19/52

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428/1; 428/402.2; 428/402.81

[58] Field of Search 252/299.01, 299.7, 299.5,
252/299.1; 350/350 R, 341, 349, 347 V, 334;
428/402.2, 402.21

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[57] ABSTRACT

A liquid crystal apparatus includes a plurality of volumes of liquid crystal material in a containment medium. At least some of the volumes are interconnected. The walls defining the volumes tend to distort the natural liquid crystal structure in the absence of an electric field, and the optical and electrical properties of the materials are such that in the absence of a field incident light is scattered or absorbed and in the presence of a field, scattering and/or absorption are reduced. The apparatus may be used in an optical display, optical shutter, billboard, etc., and it functions independently of polarization. Methods of making and using the apparatus also are included in the invention.

52 Claims, 24 Drawing Figures

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